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DR. ADALBERT FENYES

BY H. C. FALL

Tyngsboro, Mass.

On a morning in early spring in the year 1897 there called at my door in Pasadena, California, a gentleman of pleasing personality, who, though speaking English perfectly, spoke it with a slight accent that indicated a foreign nativity. He introduced himself as one interested in entomology, and said he had been directed thither by the city librarian. My visitor became so enthusiastic over what I had to show him that instead of continuing on a world tour with his wife as projected they decided to remain awhile in Pasadena and to that end rented a beautiful home on Orange Grove Ave. for an indefinite residence. This was my first meeting with Dr. Fenyes, the subject of this sketch, and the beginning of a close and cordial intimacy which lasted throughout the twenty remaining years of my residence in Pasadena.

Dr. Adalbert Fenyes was born in Arad, Hungary, Nov. 17th, 1863. His father, Carolus Fényes, was an attorney and of noble birth. Dr. Fenyes was an honor graduate of the University of Vienna; he was at the Court of Emperor Franz Joseph as an officer in the Army Reserve, being a physician. In 1893 he went to Cairo, Egypt, where he practiced medicine for several years, associating there with the highest potentates of the city. It was here that he met his first wife, a New York lady, whom he married in Florence, and with whom he was making a world tour when his trip was interrupted at Pasadena as I have mentioned above.

Dr. Fenyes was always a great nature lover and in his early years was a devotee of Ornithology, but he had already become a confirmed Entomologist before coming to America.

Once established in Pasadena the Doctor immediately procured the necessary equipment and began systematic collecting in the vicinity. Within a short time he brought me specimens of two rare Melyrids, *Microlipus prolixicornis* Fall and *Listrus*

definitus Fall, previously unknown and so far as I know not since taken by any other collector. His crowning discovery however came several years later when he turned up on Mount Wilson specimens of that large and handsome Eucnemid *Palaeoxenus dohrni* Horn, which, though said to have been found at San Diego, was believed by its describer to have really come from tropical America.

For a good many years Dr. Fenyes made extensive collecting trips to various parts of the country and to Mexico. By this means and by exchange and purchase he rapidly amassed a very large general collection, including much exotic material; also a valuable library, both being housed in a fireproof building erected for the purpose. About 1905 he began a special study of the Staphylinid tribe Aleocharinæ. He devoted himself to this work with so much energy and success that in ten years he became recognized as a world authority on this difficult group and was asked to prepare the manuscript thereon for the Wytsman Genera Insectorum. Aside from this monumental task he published about a dozen short papers on his specialty. Moreover at the time he ceased all activity in Entomology, some ten years or more ago, he had completed the manuscript and drawn the plates, containing 766 accurately colored figures, for a monograph of the North American Aleocharinæ, a work of such magnitude that no publisher at the time could accept it, and it now passes with his collection into the custody of the California Academy of Sciences.

Dr. Fenyes continued the practice of his profession in Pasadena. He was a pioneer in the use of the X-ray for medical purposes and installed in his office the first X-ray machine to be brought to that city. In recognition of his work in this field he was made an honorary member of the American Medical Society.

After ceasing active work in Entomology he took up gardening as a hobby, specializing in the raising of fine carnations, importing seeds from England and developing specimens that attracted the attention of horticultural experts. He also gave much time in later years to music.

Highly educated, an accomplished linguist, a distinguished physician, a world famed entomologist, an ardent horticulturalist,

a connoisseur in music; truly a remarkably versatile man, and withal a gentleman of the finest type.

Dr. Fenyes died February 22nd, 1937, after a short illness. His second wife, Louise Hiller Fenyes, whom he married May 14, 1930, survives him. He left no children.

Dr. Fenyes' large collection of Coleoptera, numbering around seventy-five thousand specimens, both native and exotic, as well as his library and all his manuscript have been purchased by the California Academy of Sciences and removed to San Francisco. His specialized collection of Aleocharinæ, included in the above, comprises some nineteen hundred species and 19,600 specimens from all quarters of the globe, and is probably unequalled in any other collection in the world. The California Academy is certainly to be congratulated in securing this extremely valuable material.

Uber Entomologische Sammlungen

The third part of this work, under the editorship of Dr. Walter Horn of the Deutsches Entomologisches Institut at Berlin-Dahlem, has just been published, August 1, 1937. This brings the work to completion, making a volume of 536 pages of text and 38 plates. In this most useful publication are given in alphabetical order, the names of all entomologists, present and past, who have assembled collections of insects of any extent, together with the places where these collections are deposited. The plates give reproductions of characteristic labels of all important entomologists. In addition the third part gives some few short biographies, remarks concerning insect collections and discusses the question of the future of systematic entomology.

The work is a splendid one with a great amount of important data concerning the collections of the world which has been painstakingly assembled by Dr. Horn and his assistants, over a period of many years. No student of entomology who wishes to know something of the collections of the world, where they are to be found, or get an idea of the individual manner of labeling or characteristic autography, can afford to be without this most useful publication.—Edwin C. Van Dyke.

BEES FROM SAN MIGUEL ISLAND, CALIFORNIA

BY T. D. A. COCKERELL

The bees recorded below were taken during the last week of July, 1937, on the occasion of the expedition of the Senior Boy Scouts to the Island.

BOMBUS CALIFORNICUS Smith

Rather common on San Miguel, at flowers of *Mesembryanthemum crystallinum*, July 28 and 30. One is a male, with long antennæ and two yellow-haired tergites.

On the mainland, at Santa Barbara (July 16 at flowers of *Leptospernum*) Francheschi Park (July 17, at Gaillardia) and at Montecito (July 18, collected by Donal Jones) the similar looking *Bombus* is *B. vosnesenskii* Radoszkowsky. Also on the mainland, at Carpinteria, July 17, at flowers of *Vicia*, I took *B. fervidus* Fabricius.

Bombus nevadensis miguelensis Cockerell, new subspecies

Male. Hair of face nearly all black: lower part of pleura with black hair; dorsum of thorax with a very large pure black patch, which does not nearly reach tegulæ at sides, though the interval between the patch and the tegulæ has black hair intermixed; first two tergites with light yellow hair, third with black hair basally but a broad light yellow fringe; fourth tergite with black hair, apex with red. The genitalia are of the *B. nevadensis*, not *B. crotchii*, type.

California: San Miguel Island, July 28, 1937, taken by William Smith.

Bombus crotchii semisuffusus Cockerell, new subspecies

Female. Hair of occiput and vertex all black; yellow band of second tergite much weaker, not broad and sharply defined, its middle portion dusky; the two apical tergites have red hair. The basal nervure goes a little basad of nervulus in this species.

California: San Miguel Island, July 30, at flowers of *Mesembryanthemum crystallinum*.

Epeolus eastwoodæ Cockerell, new subspecies

Male. Length about 8 mm.; black, including antennæ, but the tarsi entirely red, and the tibiæ reddened at apex; tegulæ bright chestnut red posteriorly, but black in front; apical plate of abdomen reddish black; eyes very dark greenish. Head broad, orbits converging below; face densely covered with pure white hair, except apex of clypeus which is dull and minutely granular, with the margin shining; mandibles bright red in middle; scape swollen, highly polished; flagellum rather thick; mesothorax and scutellum dull and minutely sculptured; hair of thorax above distinctly tinged with ochreous; anterior middle of mesothorax densely covered with hair, taking the form of two very broad bands separated by the median incised line, each band emarginate posteriorly; anterior corners of mesothorax covered with hair, weakened mesad and just reaching the bands; posterior margins of mesothorax and scutellum (the latter including axillæ) covered with hair, the band on mesothorax broadened at sides; postscutellum with dense pale hair; metathorax hairy at sides, the median and basal bare areas dull seen from above, but moderately shining from another angle; mesopleura mainly densely hairy, but with a transverse bare spot on upper part, and a large bare area (shining between punctures) below; wings a little dusky at apex; recurrent nervures joining second and third cubital cells near middle; hind coxæ with a conspicuous band of pure white hair; pale hair of legs otherwise slightly ochreous; spurs pale red; black area of first tergite a broad transverse band, straight in front, obliquely truncate at sides, angulate in middle posteriorly, almost dividing the apical hair-band; hair-band of second tergite rather broadly interrupted in middle, and having a rounded projection at each side in front, the angle formed by the projection and the band beyond a little less than a right angle; hair-bands on tergites 3 to 5 narrowly interrupted, the upper margin of that on third strongly undulate; first two sternites mainly covered with white hair, and third with an apical band, which is slightly interrupted in middle.

California: San Miguel Island, Cuyler's Cove, near the shore, July 27, 1927 (Cockerell). It was at flowers of *Malacothrix implicata* Eastwood. In my tables it falls nearest to *Epeolus heterurus* Cockerell and Sandhouse but it differs in the pattern of the thorax, the partly bare mesopleura, the very short axillar spines, the clearer wings, narrower third cubital cell, straight anterior margin of black area on first tergite, and other characters. The mark on first tergite is much more like that of *E. rufomaculatus* Cockerell and Sandhouse. Named after Miss Alice Eastwood,

who has advanced our knowledge of the flora of the islands more than any other living botanist.

Anthidium palliventre vanduzeei Cockerell, new subspecies

Larger (female about 12.7 mm. male about 14.5 mm.) all the tibiæ of male with a yellow stripe; corners of sixth tergite of female prominent.

California: San Miguel Island. First found (one female) by Mr. E. P. Van Duzee, who was the first to collect a bee on San Miguel Island. I took a pair at Cuyler's Cove, July 30, 1937, hovering over *Phacelia scabrella* Greene. The male is the holotype.

Anthophora californica erysimi Cockerell, new subspecies

Female. Larger and more robust, with broader face, and black instead of green eyes; width of head nearly 5 mm. width of abdomen nearly 6 mm.

California: San Miguel Island, on the top, at flowers of *Erysimum insulare* Greene, July 20, 1937 (Cockerell).

At Santa Barbara, August 2, my wife took *A. urbana* Cresson at flowers of *Lantana*. This species has a representative or subspecies (*A. catalinae* Cockerell, 1901) on Santa Catalina Island.

Agapostemon californicus psammobius Cockerell, new subspecies

Male (type). Scape all black; hind tibiæ marked with black; hind femora usually with a continuous broad black band, bent in middle, on inner face (in one specimen this band is interrupted); venter with less yellow; genitalia with the squama intermediate in type between that of *A. texanus* and *A. angelicus* as figured by Sandhouse (Jl. Wash. Acad. Sci., 26, 1926, p. 81); the slender curved lower lobe is essentially as in *A. texanus*, but the upper one is produced, slender, like the end of a finger, the sinus between the lobes is elongate-oval; rounded below.

Female. Metathorax above less sculptured, the rugæ indistinct; tegulæ very dark brown, or a little green in front, with a yellow spot.

The male differs from Crawford's description of *A. californicus* thus; wings not clouded apically; front and middle femora broadly black above; hind femora as described above; venter with yellow only on basal part.

California: San Miguel Island, end of July, mostly at flowers of *Mesembryanthemum crystallinum* on the top of the island, but one female near the shore, Cuyler's Cove, at *Malacothrix implicata*. On Princess Islet a fragmentary male, remarkable for having the yellow band on first tergite rather broadly interrupted, was found in a web of *Metepeira gosoya* Chamberlin and Ivie (det. Gertsch), in a clump of prickly pear, *Opuntia littoralis* (Engelmann). In this specimen the mesothorax is of a splendid purple-blue.

I collected *A. californicus* Crawford at Santa Barbara, July 11-17, at flowers of *Mesembryanthemum*, *Scabiosa* and a boraginaceous plant. The female has the metathorax above strongly sculptured, the rugæ strong and regular; tegulæ fulvotestaceous, with a yellow spot. The male has or lacks a yellow stripe on scapa.

Halictus pavonotus Cockerell

This very distinct species has been known from the sand hills at Pacific Grove and San Francisco. Sixteen males were taken on San Miguel, but no females. One male bee has the head unusually broad (diam. pr. 2.5 mm.) but is only an individual variation. All were taken at Cuyler's Cove, visiting flowers of *Malacothrix implicata*.

Halictus (*Seladonia*) *meliloti catalinensis* (Cockerell) was taken in some numbers at Santa Barbara, females at flowers of Ceanothus and fennel. This bee was described from Catalina Island, but has long been known to be common on the mainland. No *Seladonia* occurred on San Miguel. The only other metallic-colored *Halictus* which I took at Santa Barbara was *H. helianthi* Cockerell, females common on fennel, but also taken on *Ceanothus* and marguerite daisy. This was not found on San Miguel.

Halictus (Chloralictus) grinnelli, Cockerell

One female was taken, at flowers of *Eschscholtzia* near the ranch house, on the top of the Island. I cannot separate it from *H. grinnelli* described from the Coronado Islands.

Halictus (Chloralictus) nevadensis Crawford

San Miguel, one female on top of Island, near ranch house, at flowers of *Eschscholtzia*, July 31. This has the general ap-

pearance, yellowish wings and reddened tarsi, of *H. nevadensis*, but compared with a paratype, differs by the longer area of metathorax and depressed line down middle of scutellum. The latter character is evident in a specimen of *H. nevadensis* I collected on the Coronado Islands. My series of specimens, attributed to *H. nevadensis*, is variable, and it is possible that closer study, with more material, will prove the existence of more than one species.

Halictus (Chloralictus) megastictus Cockerell, new species

Female (type). Length about 6 mm., anterior wing 4; head and thorax rather dark green, with long outstanding entirely white pubescence; head broad, with projecting clypeus; antennæ black, mandibles dark red at extreme apex; apex of clypeus thickened, black; supraclypeal area large, brassy; mesothorax dullish, finely punctured, the median groove strong; scutellum shining on disc; area of metathorax broadly truncate behind, with thickened margin, the surface dull, the sculpture not distinctly seen under a lens; metathorax dark bluish; tegulæ large, black, very strongly punctured, rounded behind; wings clear hyaline, not reddish, the stigma and nervures very pale; legs black with abundant white hair, the hind basitarsi with a red apical brush; hind spur with four spines, the first two very long; abdomen shining black, the first tergite a little greenish; basal corners of second tergite, and the following ones entirely covered with white tomentum, which under the microscope has the appearance of small scales, though there are also long hairs; the fourth tergite is distinctly green under the hair.

Male. Similar, with the same large, black, punctured tegulæ; no light markings in region of mouth; clypeus with two shining elevations; face covered with white hair; flagellum long, pale red beneath; mesothorax highly polished on disc; scutellum with a median sulcus; plicæ at sides of area of metathorax very distinct; no light color on legs; abdomen shining black, the first three tergites with basal corners covered with pale hair, the others hairy all over, some of the hairs long, the others short and plumose.

San Miguel Island, end of July (Cockerell). The female at flowers of *Malacothrix implicata*, at Cuyler's Cove. This is superficially similar to *H. grinnelli*, and I had confused the two until I observed the tegulæ. Being a comparatively large species with punctured tegulæ it suggests *H. nymphaearum* Robertson, but that is considerably larger, with the area of metathorax very coarsely sculptured; in the male the scutellum is strongly bigibbous, and the face more narrowed below.

Halictus (Chloralictus) perichlarus Cockerell, new species

Female (type). Length about or nearly 7 mm., anterior wing 5; olive green, including the shining abdomen, the upper part of clypeus and the supraclypeal area cupreous, margin of clypeus broadly black; pubescence long and outstanding, entirely white; antennæ and mandibles black, the latter very faintly reddish at tip; head broad, cheeks ordinary; mesothorax strongly punctured, dullish, shining on posterior disc; scutellum shining, well punctured, with no median sulcus; area of metathorax coarsely plicate, with a thick shining rim; tegulæ very dark brown or black, without distinct punctures; wings grayish hyaline, a little yellowish at base, stigma and nervures pale; legs black with white hair; hind spur with four stout spines; abdomen shining olive green, the hind margins of the tergites reddish; the abdomen has long hair at sides, and tomentum at lateral bases of second and third tergites (under the microscope this appears as minute, scale-like hairs) and the apical tergites have in addition much long hair. One specimen, which I at first thought might be distinct, has the last three tergites closely hairy all over, while the second tergite has the basal corners very broadly hairy.

Male. Smaller and slender, with parallel-sided abdomen; no light marks in region of mouth or on legs; flagellum long, dusky red beneath; mesothorax shining; abdomen with little pale hair.

San Miguel Island, end of July, eleven females and one male (Cockerell). The male was at *Eschscholtzia*, near the ranch house, July 31; three females were taken at the same time on these flowers, but all the rest were at flowers of *Mesembryanthemum crystallinum*. The following key separates it from several which are more or less related:

1. Females 2
... Males 5
2. Mesothorax strongly shining; abdomen dark green, the margins of tergites dark brown 3
... Mesothorax dull or dullish 4
3. Larger and more robust; clypeus and supraclypeal area shining green; area of metathorax dull, with fine parallel plicæ ..... *disparilis* Cresson
... Smaller; clypeus hardly at all green; area of metathorax shining, basally plicate ..... *cattellae* Ellis
4. Head oblong; mesothorax entirely dull; tegulæ pale or red ..... *pilosus* Smith
... Head broad; mesothorax shining on disc; tegulæ dark ..... *perichlarus* Ckll
5. Abdomen obscurely greenish; mesothorax highly polished; tarsi clear red ..... *disparilis* Cresson
... Abdomen strongly green 6

6. Head very broad; tegulæ and tarsi dark.....*perichlarus* C&K
... Head suboval, tegulæ pale; tarsi pale reddish.....*pilasus* Smith

The female may also be compared with *H. diversopunctatus* Ellis, which is a rather large species, with extremely hairy thorax, yellowish wings, plicæ of area of metathorax very strong, abdomen green.

Halictus (Chloralictus) punctiferellus Cockerell, new species

Female. A small species similar to *H. tegularis* Robertson and *H. tegulariformis* Crawford, with strongly punctured tegulæ and pectinate hind spur. In the Sandhouse table it runs straight to *H. tegulariformis*, except that the tegulæ are rounded posteriorly, but this character seems rather elusive depending on the angle of vision. Comparing Crawford's description of *H. tegulariformis*, it agrees in having the parapsidal grooves not apparent, and the punctures along the median groove of mesothorax not finer than the rest; but on comparing a specimen of *H. tegularis* received from Robertson, these characters do not seem very distinctive. The first tergite is very distinctly transversely lineolate, which it is not in *H. tegulariformis*, as described by Crawford. *H. tegulariformis* was described from Nevada, but according to specimens before me, it ranges from Colorado and New Mexico to Baja California. On comparing a New Mexico one with one from Baja California, the former has the area of metathorax tessellate, with few strongly divergent plicæ, while the latter has many irregular but more or less parallel plicae[1]. I strongly suspect that the species, as we have understood it, is composite. It seems, however, to be distinctly different from the Illinois *H. tegularis*.

Length about 4.6 mm., anterior wing nearly 4; head and thorax dark blue-green; pubescence rather dull white; mandibles and antennæ black, the flagellum very faintly brownish beneath; clypeus and supraclypeal area shining, clypeus rather golden-green above, a little coppery in middle, black apically; supraclypeal area colored like the shining band along orbits, the front being otherwise dull; mesothorax anteriorly with the median groove very deep, and the region on each side of it shining, though well punctured; posteriorly the mesothorax is dull; scutellum with a median depression, on each side of which is a sparsely punctured shining area; area of metathorax rather large, dull dark blue, seeming without plicæ, but the microscope shows very delicate well separated irregular radiating plicæ; tegulæ black; wings clear with very pale stigma and nervures, the stigma with no dark margin (the character of the stigma shows that this cannot be the female

[1] Michener (1937) has separated a species of this group from Albuquerque, New Mexico, as *H. albuquerquensis* n. sp.

of *H. gaudialis* Sandhouse); legs black with white hair, a copper-red brush at end of hind basitarsi; abdomen rather broad, highly polished, black with the hind margins of the tergites brown or pallid; first two tergites with pale hair at basal corners, the others hairy but not densely so.

California: San Miguel Island, end of July (Cockerell).

Halictus (Chloralictus) pilosicaudus Cockerell, new species

Female. Length about 5 mm.; wings short, the anterior wings about 3 mm.; head and thorax olive green, the metathorax darker and bluer; but not strongly contrasting; pubescence dull white, covering the last three tergites with dense tomentum; head broad-oval; clypeus short, its lower part black, its upper part and the surpraclypeal area copper red, the supraclypeal area very brightly colored with almost a rose tint; middle of mandibles broadly red; flagellum short, dull red beneath; mesothorax dullish, the microscope showing very dense, uniform, strong punctures, often running in rows; scutellum shining anteriorly; area of metathorax large, triangular, with dense vermiform plicæ (the intervals shining) on somewhat more than basal half, the apical part very minutely rugose; posterior truncation small, shining; tegulæ pale, not punctured; wings clear, faintly yellowish, the stigma and nervures very pale, the stigma with no dark margin; legs black, with reddish tarsi, the basitarsi distinctly red; hind spur with three stout teeth; abdomen black, with a faint greenish or brassy lustre, in one specimen with a purple band across first tergite; margins of tergites pallid, more or less reddish; first two tergites showing the shining surface, though the basal corners are hairy, the others densely covered with hair.

California: San Miguel Island, end of July (Cockerell). It visits *Malacothrix implicata*. Nearest, apparently to *H. brunneiventris* Crawford, differing by the dense pilosity of apical half of abdomen, and the sculpture of metathorax. In the Sandhouse table it goes to *H. nevadensis*, which (paratype compared) is a very different species, with a round head. In my table it falls near *H. sparsus* Robertson, which is really quite different.

Halictus (Chloralictus) cabrilli Cockerell, new species

Male. Length about 4.7 mm., anterior wing about 4.2; rather slender, with large broad head, approximately circular, seen from in front; head and thorax bluish green, the mesothorax highly polished, with very distinct but well separated punctures; metathorax bluer, the basal area dark blue; mandibles and region of mouth all black; flagellum long, pale red beneath; legs black, the

hind tarsi red at extreme tip; abdomen shining black, with sparse outstanding hair, conspicuous at sides; pubescence dull white, long on head and thorax; tegulæ very dark brown, without distinct punctures; wings clear hyaline; nervures and stigma very pale, but stigma with a dusky margin. Orbits converging below; clypeus shining; sides of face with much white hair; scutellum highly polished on disc, appearing rather yellowish green, strongly contrasting with the dull dark blue base of metathorax; area of metathorax short, densely rugosoplicate, the intervals shining as seen under microscope; mesopleura and sides of metathorax densely punctured; margins of third and following tergites somewhat brownish; suture between first and second tergites impressed.

California: San Miguel Island, end of July, four (Cockerell). It visits flowers of *Malacothrix implicata*. It is named after the famous explorer, who died on San Miguel. In the Sandhouse table it could be sought for near *H. lactineus* Sandhouse, from which it is easily known by the dark legs, or *H. disparilis* Cresson, which is entirely different. There is some resemblance to *H. foveolatus* Robertson, from Illinois, and among the west coast species *H. daggetti* Cockerell is rather near, but is larger, with bluish head and thorax and milky wings. *H. gaudialis* Sandhouse, from La Jolla, has strongly punctured tegulæ.

Halictus miguelensis Cockerell, new species

Male. Length about 9 mm., anterior wing 7; rather slender, black with apical band on clypeus (with a small median extension above), labrum, spots on knees, and basitarsi, all very light yellow; pubescence white; mandibles black, red at tip; antennæ entirely black; flagellum very long, reaching base of abdomen; clypeus projecting; orbits strongly converging below; front and upper part of face with much white hair; a shining line along inner orbits to the top; mesothorax and scutellum shining, with numerous fine punctures; in lateral view, the sides of mesothorax appear dull, contrasting with the highly polished sides of scutellum; area of metathorax large, dull, densely covered with parallel plicæ, the microscope shows a complex system of rugæ, forming a sort of network, and also shows that the large postscutellum is coarsely sculptured; tubercles black; tegulæ not punctured, shining brown, with a light yellow spot in front; wings perfectly clear, not yellowish, iridescent, the large stigma clear rufous, the nervures light brown; outer nervures paler but hardly weaker; front tibiæ with a narrow pale stripe its whole length posteriorly, and anteriorly pale reddish; middle and hind tibiæ with a pale yellow mark at base, and a little reddish at apex; basitarsi very pale yellow, the following joints pale reddish, except the last, which is dark; abdo-

men highly polished, thinly hairy, margins of tergites inconspicuously pallid; second to fourth tergites with conspicuous light hair at sides of base, the microscope shows that this hair is strongly plumose.

California: San Miguel Island, July 30 (Cockerell). Related to *H. nigricallis* Vachal, but more robust, with more shining disc of mesothorax, and entirely black antennæ. On account of the clear, quite colorless wings, it cannot be associated with *H. pacificus* Cockerell or *H. truncatus* Robertson. It is not *H. cooleyi* Crawford (which I took in Santa Barbara) which has much yellow on the mandibles. *H. arctous Vachal* has a yellow spot on tubercles; *H. kincaidii* Cockerell has the clypeus all black; *H. pullilabris* Vachal has the labrum black.

The holotypes of the new species will be placed in the collection of the California Academy of Sciences at San Francisco.

THE EFFECT OF STYLOPIZATION ON ANDRENA PORTERAE COCKERELL

(Hymenoptera)

BY E. GORTON LINSLEY

University of California

Few andrenid bees are more strongly sexually dimorphic than *Andrena porterae* Cockerell. The sexes are so unlike that they were originally described as distinct species[1,2] and remained unassociated until field observations suggested their identity. In addition to differences in general form and structure of mandibles, antennæ, legs, and abdomen, the females have the integument and pubescence entirely black. The male (first described as *Andrena leptanthi* Vier. and Ckll.) is brown, with the clypeus bright yellow, the pubescence pale brownish. Whatever doubt may have remained with regard to the identity of the sexes of *porterae* may now be dispelled by the capture of a stylopized female exhibiting a partial reversal of secondary sexual characters. In color, structure of posterior pair of legs, and proportions of the antennal segments the example is more or less

[1] Cockerell, T. D. A., 1900, Ann. Mag. Nat. Hist. (7) 5:401, ♀
[2] Viereck and Cockerell, 1904, Ann. Mag. Nat. Hist. (7) 14:27, ♂

intermediate between the normal male and the normal female.[3] The individual may be described as follows:

Size and form of typical female; integument dark brown; pubescence of head dark brownish, that of thorax and abdomen brown, of posterior metatarsi and tibial scopæ pale brownish; clypeus with a large, irregular, bright yellow, median spot; first segment of flagellum shorter than the three following together (in the normal female it is as long as or slightly longer than the three following, in the normal male it is but little longer than the two following together); tibial scopa thinner than usual, the hairs of the dorsal margin mostly shorter than the width of the tibia (rather than distinctly longer than the width of the tibia).

Described from an example taken at West Walker River, Inyo County, Calif., elevation 6,000 feet, on May 16, 1937, at flowers of *Ribes*, by Mr. Charles D. Michener, who very kindly presented it to the writer. The specimen has been parasitized by a male *Stylops*. A second female, captured at the same time and bearing a female parasite, exhibits no reversal of sexual characters. Apparently neither specimen was making any attempt to collect pollen since the scopæ of both females were devoid of pollen grains.

Note on the Dispersion of Pseudoscorpions

Recently while collecting moths at an electric light, I observed that an occasional moth had what seemed to be a particle of dirt attached to its tibia. In removing one it seemed to be attached by a stalk. When removed and examined with a glass, to my surprise I found it to be a pseudoscorpion. The specimen has been preserved and is now in the collection of the California Academy of Sciences.—F. E. Blaisdell, Sr.

The double number 1 and 2 of the Pan-Pacific Entomologist was mailed May 4, 1937; No. 3 was mailed September 14, 1937, and No. 4 on December 17, 1937.

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[3] For a discussion of the effects of stylopization on Aculeate Hymenoptera *cf*: Salt, G., 1927, Jl. Exp. Zool., 48:223-319, pls. 1-6.

SYNOPSIS OF THE GRYLLOBLATTIDAE WITH THE DESCRIPTION OF A NEW SPECIES FROM OREGON (ORTHOPTERA)

BY ASHLEY BUELL GURNEY[1]

INTRODUCTION

Since Walker (1914) established the family Grylloblattidæ, some twenty-five papers have been published concerning the group. In the present study a revisionary synopsis and an evalution of taxonomic characters are offered for the first time. Two genera and five species are included, of which one species is here described as new and one genus re-established as valid. The genus *Galloisiana* Caudell is composed of two subgenera, and *Grylloblatta campodeiformis* Walker consists of two subspecies.

The present study was prompted by difficulties experienced in identifying material collected in Oregon by Prof. H. A. Scullen of the Oregon State Agricultural College. Professor Scullen kindly placed at the disposal of the writer the entire series of specimens collected by him, together with full collecting notes. Through the kindness of Dr. R. H. Beamer of the University of Kansas it has been possible to examine the entire series of *Grylloblatta campodeiformis occidentalis* Silvestri collected by him on Mt. Baker, Wash., in 1931. Dr. Harlow B. Mills of the Montana State College has provided examples of *G. c. campodeiformis* Walker collected in Gallatin Canyon, Montana, in 1936. Dr. E. M. Walker of the University of Toronto has kindly loaned for study two pairs of the typical race of *campodeiformis* from the Canadian Rocky Mountains. The writer would express his appreciation to the above-named gentlemen, also to his colleague, Mr. Herbert S. Barber, for detailed information regarding the conditions under which *Grylloblatta barberi* Caudell was originally collected and their relation to the problem of natural barriers in the distribution of species. During this study specimens of all known forms, except *Galloisiana notabilis* (Silvestri), described from a single nymph collected in Japan, have been examined.

In the following key the more important character is men-

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tioned first in each couplet containing two or more characters. The word nymph refers to large, nearly mature specimens.

KEY TO THE GENERA AND SPECIES OF GRYLLOBLATTIDAE

1. Posterior-lateral angles of pronotum broadly rounded in adult (fig. 4); third segment of antenna more than twice the length of second segment (fig. 2); compound eyes somewhat reduced (fig. 2) or absent; cercus of adult composed of nine segments (fig. 3); front and hind femora shaped as in figs. 5 and 6, (Japan) . . . Genus *Galloisiana* Caudell.....2
... Posterior-lateral angles of pronotum narrowly rounded in adult (fig. 7); third segment of antenna not more than one and one-half times the length of second segment (fig. 9); compound eyes present and well-defined, general shape as in fig. 9; cercus of adult composed of eight segments (fig. 1 and 8); front and hind femora shaped as in figs. 10 and 11, (North America) . . . Genus *Grylloblatta* Walker.....3
(Genotype, *Grylloblatta campodeiformis campodeiformis* Walker, by monotypy.)
2. Compound eyes present . . . *Galloisiana*, subgenus *Galloisiana* Caudell (Type and only species, *Galloisia nipponensis* C. & K., 1924).
... Compound eyes absent . . . *Galloisiana*, subgenus *Ishiana* Silvestri (Type and only species, *Grylloblatta* (*Ishiana*) *notabilis* Silv., 1927).
3. Dorsal valve of ovipositor clearly reaching to middle of cercus, usually to the sixth segment (fig. 1); antenna of adult composed of 36 segments or less, of nymph[2] not over 30; cercus normally not exceeding 1.8 times the length of pronotum, (Alberta, Montana, Washington) 4
... Dorsal valve of ovipositor not reaching to middle of cercus, seldom beyond the fourth segment (fig. 8) (adult of *barberi* unknown); antenna of adult frequently composed of 39 or more segments, of nymph often of more than 30; cercus longer than above, normally 2 times or more the length of pronotum, (Northern California, Oregon).....5
4. Antenna of adult composed of 27-30 segments, of nymph seldom more than 26, (Alberta and Montana).....
.....*campodeiformis campodeiformis* Walker (1914)
... Antenna of adult composed of more than 30 segments, of nymph usually more than 26, (Washington).....
.....*campodeiformis occidentalis* Silvestri (1931)
5. Antenna of nymph composed of 36-40 segments; compound eye prominent, proportion of greatest length of eye to width of eye to width of head about as 1:4.4; color of body grayish brown, (Northern California).....*barberi Caudell* (1924)

[2] Reference is here made to large, nearly mature specimens.

... Antenna of nymph normally containing 31-32 segments; compound eye distinctly smaller than above, proportion of greatest length of eye to width of head about as 1:5.8; color of body light amber, paler than in *barberi*, (Oregon) ..... *sculleni*, new species

The Genus GALLOISIANA Caudell

Galloisia Caudell and King, Proc. Ent. Soc. Wash., Vol. 26, pp. 53-60, 5 figs., 1924. (Genotype, *Galloisia nipponensis* C. & K., by monotypy.)

Galloisiana Caudell, *Ib.*, No. 4, p. 92, 1924. (New name for *Galloisia* C. & K., preoccupied by *Galloisia* Hustache, Bull. Mus. Paris, Vol. 26, fasc. 6, p. 493, 1920, in Coleoptera.)

Grylloblatta (*Galloisiana*) Silvestri, Boll. Lab. Zool. Scuola Sup. Agr., Portici, Vol. 20, p. 112, 1927.

Grylloblatta (*Ishiana*) Silvestri, *Ib.*, p. 113.

The genus *Galloisia* was proposed by Caudell and King for the species *nipponensis*, represented by one adult male and two nymphs collected by the junior writer in Japan. The original authors, in giving the generic diagnosis, emphasized the presence of lateral flange-like pads at the apices of the basal four segments of each tarsus. Other characters mentioned as being of probable generic importance were nine-segmented cerci, and a third antennal segment about three times the length of the second. Cerci of adult *Grylloblatta* are eight-segmented and, according to Caudell and King, the tarsi are cylindrical and lack pulvilli and lateral pads.

Crampton (1927) enumerated the above generic characters given by Caudell and King and accepted the Japanese species as probably belonging to a genus distinct from *Grylloblatta*. He also attributed generic significance to several characters taken from the specific description of *nipponensis*. He reported, however, that distinct tarsal pads, though smaller than in *Galloisiana*, are present in *Grylloblatta*.

Later in the same year, and being acquainted with Crampton's paper, Silvestri (1927) discussed the immature stages of two species collected in Japan. After comparing these with nymphs of *Grylloblatta campodeiformis* Walker (apparently adults of *Galloisiana* were not available for study) he placed *Galloisiana* as a synonym of *Grylloblatta*. The nymphs reported by Silvestri included three male specimens collected at the type locality of

nipponensis and identified as that species, and a single male nymph taken near Nagasaki (about 600 miles from Nikko, near where *nipponensis* was taken). This nymph was described as *Grylloblatta notabilis*, a new species and type of a new subgenus, *Ishiana*. *Ishiana* was particularly characterized by the absence of eyes.

In the present paper *Galloisiana*, with *Ishiana* as a subgenus, is reëstablished as a valid genus on the following grounds:

1. One of the two most important characters, in the writer's opinion, is the shape of the pronotum as shown in figs. 4 and 7. Nymphs of the two genera do not exhibit such differences in the outline of the posterior-lateral angles; but the adult *Galloisiana nipponensis* is very distinct from *Grylloblatta* adults in this respect, and, if the shape of the pronotum in this group is nearly as significant as in Dermaptera and Blattidæ, it is certainly of generic value.

2. The blind condition described for Silvestri's *notabilis* is not difficult to visualize after one examines the type material of *nipponensis*. The compound eye is elongate, as shown in fig. 2, and the outlines of the eye and its facets are obscure, in contrast to the differently-shaped conspicuous eye of *Grylloblatta* (fig. 9). It seems evident that there is a strong tendency toward the reduction of eyes in the known Japanese members of Grylloblattidæ. That they form a complex distinct from the Nearctic species is fairly clear. On the basis of the single reported nymph of *notabilis*, no change is justified other than to ally it with *Galloisiana* rather than *Grylloblatta*, because of its blindness. *Ishiana*, accordingly, is here considered a subgenus of *Galloisiana*. The discovery of the adult may indicate whether the species is blind in all stages and further show the proper placement of the species.

3. The different proportions of the third antennal segment in comparison with the second segment in the two genera are shown in figs. 2 and 9. The constancy of the character is demonstrated by the four American forms. The third antennal segment of *notabilis*, as figured by Silvestri (1927), is longer than in the corresponding stages of *Grylloblatta*. Since the two complexes indicate the stability of this character it is reasonable to consider proportional lengths of antennal segments of generic importance as they are in certain Dermaptera.

4. All records of adult Grylloblattidæ indicate the number of nine segments in the cercus of *Galloisiana* and eight in *Grylloblatta* to be constant, although, as noted by Caudell and King, the basal two segments are very closely united in *Galloisiana* (fig. 3). In Plecoptera the number of segments of the cerci is frequently of family significance and it seems advisable to consider even the relatively slight difference observed in the Grylloblattidæ, with respect to this character, as probably of generic value.

5: The spurs and spinelike setæ appear somewhat heavier in *Galloisiana*, and the legs (figs. 5 and 6) seem to be definitely stouter, than in *Grylloblatta* (figs. 10 and 11). These features will probably prove to be constant.

6. As stated by Crampton in 1927, adults of *Grylloblatta* preserved in alcohol show unmistakable lateral pads on the tarsus. Each pair of pads may represent a pulvillus which has become divided in the process of evolution. Although these pads are considerably smaller than those of *Galloisiana*, this character appears to be of minor value as compared to the shape of the pronotum and the reduction of the eyes. Unfortunately, the figures of tarsi shown by Caudell and King are somewhat misleading, since comparison is made between short, flattened segments of an adult *Galloisiana* (then called *Galloisia*) and elongate, cylindrical segments of a nymphal *Grylloblatta*. The tarsi of adults of *Grylloblatta* approach in form those of *Galloisiana*. The hind tarsi of *Grylloblatta*, particularly the basitarsi, appear more distinct from those of *Galloisiana* than the front and middle tarsi, which are very similar in the two genera. The incorrect statement that the tarsi of *Grylloblatta* lack pulvilli apparently originated with Walker's (1914) accidental use of the term "pulvilli," when he obviously meant "arolia," in the orignal description. Arolia between the claws are absent, and pulvilli are present on at least the fifth segment of front and middle tarsi, in both genera.

7. Since the elongate projection of the male supra-anal plate of *Galloisiana* is not present in *Grylloblatta*, it may be a valuable character. Until more information is available, however, the writer hesitates to consider specialization of genitalia as generic.

The Genus GRYLLOBLATTA Walker

Grylloblatta Walker, Can. Ent., Vol. 46, pp. 93-99, 1914. (Genotype, *Grylloblatta campodeiformis* Walker, by monotypy.)

Grylloblatta sculleni Gurney, new species

(Figs. 7-11)

Female: General form elongate, slender; body with fine pubescence. Head with parietal sutures well defined; lateral area with two spine-like setæ about mid-way along parietal suture, a slightly oblique row of four similar setæ mid-way between suture and lateral margin of head, about six setæ along margin of head at the occiput. Coronal suture and frontal sutures indistinct; two well-spaced setæ borne in each frontal suture. Postclypeus and anteclypeus plainly differentiated, their anterior margins slightly and evenly rounded. Labrum covered with fine setae. Compound eye sharply defined, distinctly smaller than antennal socket (fig. 9). Basal segments of antenna as illustrated (fig. 9), right antenna composed of 39 and left of 32? segments, respectively.

Pronotum as illustrated (fig. 7); the posterior-lateral angles narrowly rounded. Ventral-anterior margin of front femur with closely set row of about 16 stout spine-like setae; the ventral-posterior margin with about 6 weak, scattered setæ (fig. 10). Hind femur as illustrated (fig. 11). Tarsus of front leg with segments shorter than those of middle leg, segments of rear tarsi longest. Lateral flange-like tarsal pads at apices of first four tarsal segments (small but distinct); pulvillus well developed on apical segments of front and middle tarsi, lacking on hind tarsus.

Abdomen and appendages typical of the genus; gland on basal sternite well developed. Dorsal valves of ovipositor reaching about to base of fifth segment of cercus. Ovipositor and cerci as illustrated (fig. 8).

Coloration: General coloration light amber, ventral surface of body of a lighter shade than above. Setæ of body and appendages, tips of tibial spurs and tips of tarsal claws brown. Compound eyes black.

Measurements: Length of body, 23.0 mm.; of antenna, 17.0; of eye, 0.53; of pronotum, 3.15; of rear femur, 5.0; of dorsal valve of ovipositor, 3.45; of cercus, 7.2; width of head, 3.22; of pronotum, 2.63; of rear femur, 0.9.

In addition to the holotype described above, two adult females and eight nymphs, including a male 12 mm. in length, are considered paratypes. The apical antennal segments are broken from several specimens, the maximum number being 35 in the adults and 32 in the nymphs. The maximum head width is 3.15 mm. and 3.16 respectively in the two adult paratypes. The eye

length is 0.45 mm. and 0.58 in the two adult specimens. In other respects they agree essentially with the holotype.

Type locality. Scott Camp (6,600 feet, altitude), Three Sisters, Cascade Mountain, Oregon.

Type. No. 52017, U. S. National Museum.

The holotype female, one adult female paratype, and six small nymphal paratypes collected July 12, 1936, by H. A. Scullen and Robert Rider. One adult female paratype and two large nymphal paratypes collected at the type locality August 6, 1935, by H. A. Scullen and George Ferguson. Two adult and three immature paratypes are returned to Professor Scullen.

Professor Scullen, for whom this species is named, has furnished the following notes:

"On the day in question (August 6, 1935), the car was left at the C. C. C. camp located at what has for a long time been called Frog Camp, on the west side of the McKenzie Pass. From Frog Camp the skyline trail was followed to White Branch Meadow and from there to the snow line near Obsidian camp, at an elevation of about 6,600 feet. Within less than half an hour one immature specimen of *Grylloblatta* was found among the crushed rock at the border of the melting snow. Further searching brought to light an additional immature specimen. In both cases they were taken among the small particles of rock wet with the water from the dripping lower border of the snow. No additional specimens were taken in the neighborhood of this snow patch. Search was then made along the border of a more extended snow area, with the result that a mature female was taken among the broken pieces of rock close to the snow. No additional specimens of this group were taken during the two hours of collecting.

"There is no doubt that this insect is common if one can succeed in reaching its normal habitat. The difficulty, however, is in being able to dig under the shale rock for the specimens. I saw several adult specimens which I was unable to collect, because just at the instant I was ready to capture them a landslide of shale rock came down in my direction and I was compelled to give way."

Elsea (1937) has recently reported the collecting of two females of *Grylloblatta campodeiformis* near Crater Lake, Ore-

gon, on November 27, 1936. Although his specimens have not been examined, it seems probable that a form of *Grylloblatta* other than the typical race of *campodeiformis* is represented, perhaps *sculleni*.

Taxonomy and Bionomics of the Group

The accompanying key presents the distinguishing characters of the four known forms of *Grylloblatta* . The number of antennal segments has formerly been considered the most important specific character. In *c. campodeiformis* the number has not been reported previously in excess of 29, and since *c. occidentalis* exhibits 32-36 segments as now known, the latter form would seem to be valid. Among ten specimens of *c. campodeiformis* from Montana which have been examined by the writer are three with antennal counts of 29-30, 29-30, and 28-30 respectively; the others do not exceed 27 and some have broken antennæ. Although the naming of species in primitive orthoptera merely on the basis of a slight difference in number of antennal segments would seem to be a questionable practice, at present it seems best to recognize the two as distinct subspecies on the difference in the number of antennal segments.

The new species, *sculleni*, is clearly distinct from either form of *campodeiformis* on the basis of the ovipositor and cerci, as well as by the other differences given in the key. Although adults of *barberi* are not known, the maximum number of 40 antennal segments and the large dimensions of the cerci and femora in the nearly mature nymphs indicate its distinctness from *campodeiformis*. and its probable relation to *sculleni*. From the latter species *barberi* may be separated by the characters given in the key. The nymphal eye of *barberi* is larger than that of the adult *sculleni*. When adults of *barberi* are known other differences may become apparent. Until then, it seems best to describe *sculleni* as a distinct species; subspecific rank may later be advisable.

As mentioned by Crampton (1927), the right coxite of the male of *Grylloblatta c. campodeiformis* bears a dorsal process, illustrated by Walker (1919, fig. 8; 1922, fig. 69), which is not present in *Galloisiana*. Adult males of *c. occidentalis* agree with those of *c. campodeiformis* in this respect and no other genitalic differences have been found. Neither do the ovipositors of the

two forms show any appreciable differences.

Our knowledge of the biology of *Grylloblatta* is derived mainly from the following papers: Caudell (1923), Ford (1926, 1937), Silvestri (1931), Beamer (1933) and Mills and Pepper (1937). Specimens have usually been collected from beneath stones, pieces of wood, or other objects in cold surroundings, but snow has not always been present. Most collections have been made at altitudes of 5,000 feet or higher. The type locality of *barberi* is at an elevation of slightly more than 2,000 feet in the valley of the Feather River, at the base of Lassen Peak, Calif. Cold air from this mountain, which is over 10,000 feet in height, doubtless chills the nearby valley and provides suitable conditions for *Grylloblatta*. Mills and Pepper have suggested that the rock-strewn, talus slopes where *Grylloblatta* is most frequently found provide a means for the insects to select favorable living conditions by retreating back under the debris or advancing to the open air, to suit their own tastes. Available data suggest that the food may include some plant material and that in certain favorable stations insects that have been killed by the cold may be an important item of diet. Miss Ford (1937, p. 282) reports that under suitable laboratory conditions individuals "have lived for three and four years, slowly reaching maturity and depositing eggs." Mills and Pepper, as well as Miss Ford, have found *Grylloblatta* sensitive to temperature changes and prostrated by a degree of warmth in which most insects thrive. Buckle (1925) states that a specimen of *c. campodeiformis* showed signs of distress and soon died when placed in direct sunlight. It seems clear that, like the adults of the mecopteron *Boreus* and the tipulid *Chionea*, *Grylloblatta* is adapted to live normally in locations which are always near freezing. The Japanese *Galloisiana nipponensis* was taken in and beneath decaying logs and under conditions of cold, although snow was not present. Silvestri (1927) found that the alimentary canal of *nipponensis* contained arthropod remains.

The distributional data regarding *Grylloblatta* are still very fragmentary, but the evidence points to the presence of many widely separated, more or less isolated, units of population which may eventually be found to extend southward as far as New Mexico in the East and the San Bernardino Mountains of California in the West. The three forms in the Pacific Coast States are

distinct and the natural barriers rather clear. The Oregon species, *sculleni*, is separated from *G. c. occidentalis*, occurring on Mt. Baker, Wash., by the Columbia River Valley. *G. barberi* occurs in the Sierra Nevada Mountains in Plumas County, California, and is separated from its nearest Cascade relative by valleys in the watershed of the Klamath River. The known centers of distribution for *G. c. campodeiformis*, Banff, Alberta, and Gallatin Canyon, Mont. (reported by Strand, 1937, p. 38, fig. 7), are separated by about 500 miles, but in the same mountain range. Specimens from Emerald Lake and Mt. Edith Cavell, Alberta, agree with Montana individuals.

Since *Grylloblatta* is restricted to definite favorable habitats and has no means of rapid dissemination, it follows that the species are likely of ancient distribution. In this connection it may be observed that the two subspecies of *campodeiformis* are within or very near the limits of the main areas of glaciation during Pleistocene time, while the localities of *sculleni* and *barberi* were each characterized by separate and individual local glaciations. This fact gives added evidence for the distinctness of the Pacific Coast species.

Regarding the ordinal position of the Grylloblattidæ, it is purely a question as to how much the currently accepted orders are to be divided, which determines whether the order Notoptera (Crampton, 1915) should be accepted, whether it should be considered a suborder (Crampton, 1933, p. 102) of Orthoptera, or whether the group should be treated as a family of Orthoptera. Future morphological studies by Walker and others may give added weight to one belief; for the present the writer prefers to follow Hebard (1930) in treating the Grylloblattidæ as a family of Orthoptera. A number of ordinal names, in addition to Notoptera, have been proposed, chief among which are Grylloblattoidæ (Brues and Melander, 1915) which was later changed to Grylloblattodea (Brues and Melander, 1932), and Grylloblattaria (Bruner, 1915, p. 2). A full discussion of the phylogenetic relationships of the Grylloblattidæ is furnished by Crampton (1933).

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EXPLANATION OF PLATE

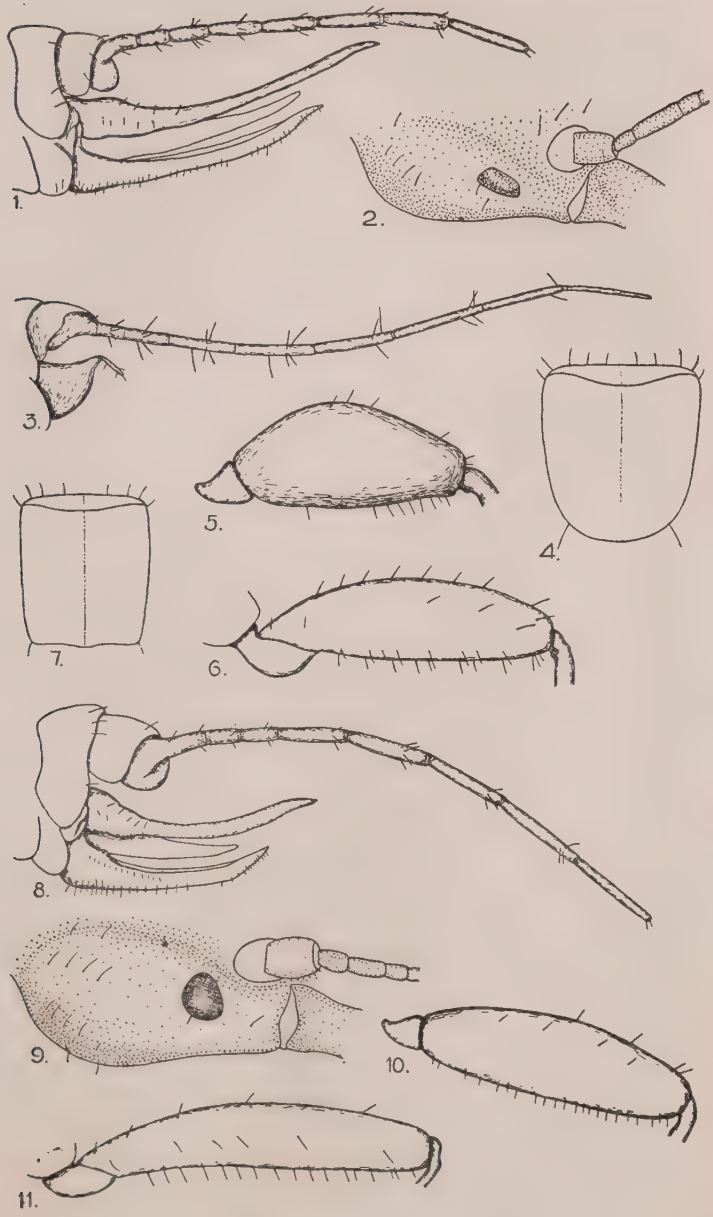
Fig. 1. *Grylloblatta campodeiformis occidentalis* Silvestri, lateral view of apex of female abdomen; Fig. 2. *Galloisiana nipponensis* (Caudell and King), lateral view of head; Fig. 3. Same, lateral view of apex of male abdomen; Fig. 4. Same, dorsal view of pronotum; Fig. 5. Same, lateral view of posterior surface of right front femur with associated trochanter and base of tibia; Fig. 6. Same, lateral view of anterior surface of left hind femur with associated trochanter and base of tibia; Fig. 7. *Grylloblatta sculleni,* new species, dorsal view of pronotum; Fig. 8. Same, lateral view of apex of female abdomen; Fig. 9. Same, lateral view of head; Fig. 10. Same, lateral view of posterior surface of right front femur with associated trochanter and base of tibia; Fig 11. Same, lateral view of anterior surface of left hind femur with associated trochanter and base of tibia.

Eudiagogus pulcher Fahr.

This attractive and well known weevil, which has previously been reported only from Florida, Texas and Jalapa, Mexico (Höge), has been taken in limited numbers at trap lights at Calexico, Imperial Valley, California, August 23, 1937, by J. K. Ellsworth. This extends its known distribution clear across our southern border. It feeds on senna (*Cassia occidentalis*) in Texas, according to Dwight Pierce.—Edwin C. Van Dyke.

Change of Name

Nodocion solaster, nom. nov. This name is proposed to replace *Nodocion zelotoides* Chamberlin (American Museum Novitates, 1936, No. 853, p. 6) which is preöccupied by *Nodocion zelotoides* Worley (Ann. Ent. Soc. Am., 1928, vol. 21, p. 621). —Ralph V. Chamberlin.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AN ANNOTATED LIST OF THE INSECTS, MOSTLY COLEOPTERA, ASSOCIATED WITH JEFFREY PINE IN LASSEN NATIONAL FOREST, CALIFORNIA

BY W. HARRY LANGE, JR.
University of California, Berkeley

A complete study of the insect fauna of Jeffrey pine is a very desirable goal as it would not only add considerably to our knowledge of the life histories of these insects, but would also aid in insect control work in those localities of California where it is to be maintained for its valuable lumber or its æsthetic value.

It is the purpose of this paper to present additional observations on insects associated with Jeffrey pine. The data was recorded during the month of June 1935 near Camp No. 10, Lassen National Forest, California, at altitudes between 5,500-6,500 feet. A salvage operation in this area made the study possible.

In the following list the insects are arranged in groups according to the part of the tree attacked; the Coleoptera follow the systematic arrangement of Leng's Catalogue.

I wish to express my appreciation to Dr. Edwin C. Van Dyke for many suggestions during the preparation of this paper, and for checking the determinations of the Coleoptera. Dr. F. E. Blaisdell, Sr. kindly determined the species of *Corticeus*, and Professor E. O. Essig the Aphididæ.

Primary Insects Under Bark of Main Trunk or Branches

Melanophila gentilis Lec. Main trunk, usually near base; maximum number of pupæ June 13; adults June 10-21; single generation a year, overwintering in pre-pupal state, pupating in spring; numerous; a "fill-in" species in this locality.

Melanophila californica Van Dyke. Upper trunk and larger branches; pre-pupal larvæ and pupæ June 12; adults June 13-21; life cycle as in *M. gentilis*; with *Ips oregoni* (Eich.) causing top killing.

Dendroctonus jeffreyi Hopk. Throughout main bole; in association usually with other bark-beetles, especially *Ips emarginatus* (Lec.); full-grown larvæ June 6; pupæ June 15; considerable overlapping of broods; numerous.

Dendroctonus valens Lec. Base of bole; full-grown larvæ and pupæ June 12; fairly abundant as a "fill-in" species.

Ips emarginatus (Lec.) Throughout main bole; maximum number of larvæ June 15 (1935 attack); very numerous; usually found associated with other bark-beetles, but "pure" attacks occur.

Ips oregoni (Eich.) Upper bole and larger branches; parent adults, eggs, and small larvæ June 15; pupæ June 20; very abundant and serious as a top killer in association with *Melanophila californica* Van Dyke.

Secondary Insects Under Bark of Main Trunk or Branches

Chrysobothris caurina Horn. Adults from reproduction; June 18; few.

Chrysobothris purpurifrons Mots. Adults from reproduction or attracted to slash; June 14; common.

Chrysobothris dentipes (Germ.) Main limbs and logs at landings; adults June 10-27; June 13, pupæ and new adults found in large limb; very numerous.

Stephanopachys pacificus Csy. Bark of dying trees; adults June 5; few.

Rhagium lineatum Oliv. Under bark, main trunk; adults June 10-17; common.

Callidium cicatricosum Mann. Main bole; adults June 4-19; rare.

Pissodes yosemite Hopk. Adults from reproduction; June 14; few.

Gelus californicus (Lec.) Under bark; adults June 6-14; very common.

Hylurgops subcostulatus Mann. Bases of recently killed trees; June 17, eggs found laid in masses in egg grooves arising from the sides of the longitudinal burrow; adults June 17-19; fairly common.

Hylastes macer Lec. Under bark, main trunk; adults June 12; few.

Ips latidens Lec. Smaller limbs, with *Ips oregoni* (Eich.); adults June 8-14; fairly common.

Orthotomicus ornatus Sw. Smaller limbs, usually associated with other engraving beetles; adults June 4; few.

In Wood of Trunk or Branches

Chrysophana placida (Lec.) Main bole; adult June 12; one specimen.

Chalcophora angulicollis (Lec.) Dying or dead trees; adults attracted to logs at landings; June 5-21; very common.

Dicerca sexualis Cr. Adults attracted to logs at landings; June 8-14; numerous.

Dicerca tenebrosa Lec. Adults attracted to logs at landings; June 10; few.

Chrysobothris californica Lec. One adult female taken attracted to felled log at landing; June 27.

Asemum atrum Esch. Adults resting on trunk; June 17; few.
Liasemum mokelumne Csy. Adults on bark of main trunk; June 8-21; commonest cerambycid on both ponderosa and Jeffrey pines.
Monochamus maculosus Hald. Adults resting on trunk; pupæ and first adults June 15; common.
Cossonus ponderosæ Van Dyke. Under bark, at base of dead tree; adults June 11; few.
Rhyncolus oregonensis Horn. Under bark, base of bole, dead tree; adults June 11; few.
Gnathotrichus retusus (Lec.) Sap-heartwood at base of bole, dying trees; adults in burrows June 6; common.
Xyleborus scopulorum Hopk. Base of dead trees; adults June 6; fairly common.

Attacking Smaller Limbs or Twigs

Ernobius sp. Adults beaten from staminate catkins; June 14; few.
Callidium hirtellum Lec. Dead limbs; June 10-14; common.
Pogonocherus propinquus Fall. Limbs; adults June 3; few.
Magdalis cuneiformis Horn. Foliage; adults June 14; common.
Magdalis lecontei Horn. Beaten from foliage; adults June 8-14; very common.
Cinara schwarzii (Wilson). Aphis infesting small lateral branches of reproduction; June 13 few winged forms, mostly apterous; June 19 many winged forms; another *Cinara* sp. found on ponderosa pine; common on cut-over areas.

Defoliators

Dichelonyx crotchi Horn. Foliage; adults June 12; common.
Dichelonyx vicina (Fall). Foliage; adults June 12-14; common.
Glyptoscelis sequoiæ Blais. Foliage; adults June 14; few.
Scythropus californicus Horn. Foliage; adults June 10-14; very common.
Diprion sp. Larvæ of this sawfly very commonly collected on needles of reproduction; larvæ during June.

Feeding on Staminate Catkins

The following species were taken June 14 by beating the foliage and staminate catkins. They are not necessarily connected with this host, as some were attracted by the source of food.

Listrus sp. Common.
Asclera excavata Lec. Few.
Adelocera rorulenta Lec. One specimen.
Limonius nitidulus Horn. Very common.
Ludius triundulus tigrinus Fall. Very common.
Ludius æneipennis (Kby.). Common.

Ludius inflatus (Say.) Common.
Elater phœnicopterus Germ. Common.
Elater bimaculatus Van Dyke. Few.
Eronyxa pilosulus (Cr.) Common.
Scymnus ardelio Horn. Few.
Hippodamia apicalis Csy. One specimen.
Adalia frigida (Schn.) One specimen.
Cleis picta (Rand.) Common.
Stenochidus cyanescens carbonarius Schffr. One specimen.
Platydema oregonense Lec. One specimen.
Anoplodera chrysocoma (Kby.) Common.
Leptacmæops basalis (Lec.) Very common.
Rhinomacer comptus Lec. Common.

Associated With Polyporus Volvatus

Epuræa monogama Cr. Adults of this nitidulid collected within the sporophores; several found together; common.

Predacious Insects

Nudobius pugetanus Csy. Burrows of bark-beetles; adults June 6-12; common.
Phlœonomus pusillus Grav. Burrows of bark-beetles; adults June 6-12; common.
Platysoma punctigerum Lec. Under bark, usually associated with bark-beetle galleries; adults June 4; fairly common.
Plegaderus nitidus Horn. Under bark; adults June 4; common.
Enoclerus sphegeus (Fab.) Adults on bark; June 4-11; common.
Thanasimus lecontei (Wolc.) Adults on bark; June 11; not as common as on ponderosa pine.
Othnius lugubris Horn. Adults active on bark; June 6-8; common.
Temnochila virescens chlorodia (Mann.) Adults in crevices of bark; larvæ among frass of wood boring Coleoptera; larvæ and adults June 4; fairly common.
Tenebrioides sp. Under bark, dead trees; adults June 4; fairly common.
Ostoma oregonensis Schaef. Under bark, dead trees; June 10; few.
Lasconotus bitomoides Kraus. Burrows of *Ips oregoni* (Eich.); adults June 12; few.
Aulonium longum Lec. Burrows of *Dendroctonus* and *Ips* sp.; adults during June; common.
Deretaphrus oregonensis Horn. Crevices of bark or under bark, base of bole; June 11-12; fairly common.
Corticeus (*Hypophlœus*) *substriatus* (Lec.) Burrows of bark-beetles and other wood boring Coleoptera; dying or dead trees; adults June 4-5; numerous.
Bius estriatus Lec. Under bark; adults June 4; few.

GENERIC CHARACTERISTICS OF AONIDIELLA BERLESE AND LEONARDI, AND A DESCRIPTION OF A NEW SPECIES FROM AUSTRALIA (HOMOPTERA-DIASPIDIDÆ)[1]

BY HOWARD L McKENZIE

University of California Citrus Experiment Station

Aonidiella has for many years been accepted by the Italian coccidologists as a valid genus. In 1921 MacGillivary (3)[2] apparently concurred, although it was not until 1933 that Nel (5) stressed this point to the extent that the name was at least partially accepted by American entomologists. The genus is important because the California red scale, *Aonidiella aurantii* (Mask.) is the type species. As early as 1899 Cockerell (2) placed *Aonidiella* as a sub-genus of *Chrysomphalus*, although he gave no reason for this change. Since then economic workers have consistently placed *aurantii* in the genus *Chrysomphalus*.

Although there has been much argument about the genus *Aonidiella*, apparently no attempt has been made to define it. In the original description of this genus in 1895 by Berlese and Leonardi (1), mention was made of the kidney-shaped body. The almost circular enlargement and sclerotization of the body of the adult female at maturity does seem to be fairly characteristic. This character alone would tend to separate it from *Chrysomphalus* where the pygidium is never so strongly retracted into the body. The paraphyses of the *Aonidiella* species are, in all cases examined, very short, slender, and small as compared with the more pronounced type of paraphyses in *Chrysomphalus*. The absence of the perivulvar pores was considered of importance for many years, and, as a matter of fact, if the species lacked these structures, they were usually assigned to *Aonidiella*, regardless of any other character. However, in view of the fact that *Aonidiella comperei* McKenzie and the new species described in this report, as well as *Aonidiella orientalis* (Newstead), all possess perivulvar pores, very little importance can be given this structure as a generic character. The epiphysis or outgrowth upon the margin of the pygidium just beyond the

[1] Paper No. 371, University of California Graduate School of Tropical Agriculture and Citrus Experiment Station, Riverside, California.

[2] Numbers in parentheses indicate references at end of article.

third pair of lobes is usually very well developed. The presence of the fenestrations (window-like structures) on the body just above the pygidium (as is recognized in *comperei*, the new species described in this report, and occasionally present in a few individuals of *taxus*) may be of some importance in distinguishing species, but apparently is not of generic significance. The tubular ducts are long, slender, and usually very broad, especially those feeding the gland openings situated near the median lobes. In every species of *Aonidiella* examined, with the exception of *orientalis*, the body of the mature female is intimately associated with the scale covering.

Aonidiella eremocitri McKenzie, n. sp.

This species was collected by S. E. Flanders of this Station, while he was exploring for parasites of the citricola scale, *Coccus pseudomagnolarium* (Kuwana), in Australia, in 1931. The description was made from 12 stained specimens mounted on one slide and three scales glued to the side of the coverglass. This represented the only specimens of this species. No male scales were present. The stained specimens were removed and placed two on each slide.

Type. From *Eremocitrus glauca*, Marmor, Queensland, Australia.

Habitat. Occurring on the leaves, twigs, and larger branches.

Scale of female smooth, circular, flat, yellow, hard, and brittle, 1½ to 1¾ mm. in diameter. Male scale not identified. Apparently all species of *Aonidiella* thus far known, however, do have male scales of the typical elongate type.

Morphological characteristics: Adult female, when mounted, about 1 mm. in diameter and of the typical reniform shape. Body heavily sclerotized. Pygidium (fig. 1) not heavily sclerotized. Three pair of lobes (trullæ) present, the median pair only slightly larger than the second and third pairs. The second and third pair of lobes approximately the same size. Paraphyses small, short, slender, arranged as follows: One at the inner basal angle of median pair of lobes; one almost directly above the first plate beyond the median lobes; one at each basal angle of the second pair of lobes, the inner longer; one directly above the first plate beyond the second pair of lobes; and one at each basal angle at the third pair of lobes, the inner the longer. There are two serrate plates between the median lobes; two between the median and second lobes, both of which are cleft; two between the sec-

ond and third lobes, the inner plate of which is deeply cleft; and three beyond the third lobe, all of which are deeply cleft and quite sharply dentate. Epiphysis beyond the last three plates well developed and conspicuous. Spines on pygidial fringe situated as shown in figure 1. Dorsal wax gland openings large and arranged in three rather definite rows on each side of the pygidium. Tubular ducts broad and conspicuous. Anal opening large, slightly cephalad, of the median paraphyses. Ventral side with a few small ducts situated close to the margin of the pygidium. Vaginal opening near the center of the pygidium. Perivulvar pores present in four groups, of apparently not more than three pores, usually two, to each group. Spines on the venter situated as shown in figure 1. Six square fenestrations situated dorsally on the body just above the pygidium, usually conspicuous (see fig. 1, E).

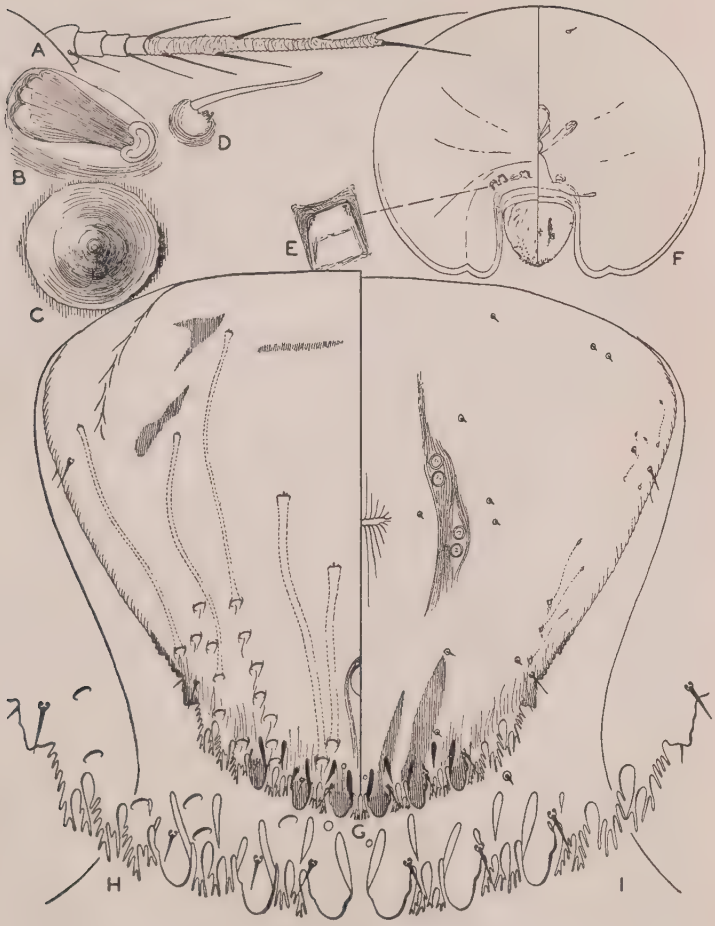
Of the species known to me this most closely resembles the false yellow scale, *Aonidiella comperei* McKenzie, from which it differs chiefly by the presence of four groups of perivulvar pores on the pygidium instead of only two groups. *Aonidiella eremocitri* n. sp. may be separated from *comperei*, *citrina*, and *orientalis*, as well as from *taxus*, and *aurantii*, by the following key:

KEY TO THE SIX SPECIES OF AONIDIELLA

1. Perivulvar pores present, ... 2
... Perivulvar pores absent, ... 3
2. Perivulvar pores in two groups, ... *comperei* McKenzie
... Perivulvar pores in four groups, ... *eremocitri* n. sp.
... Perivulvar pores in five groups, ... *orientalis* (Newst.)
3. Sclerotized structures A[3] on ventral part of pygidium present 4
Sclerotized structures A absent ..... *taxus* Leon.
4. Sclerotized structures B on ventral part of pygidium present; structure A globular, fourth lobe-like process usually inconspicuous, ... *aurantii* (Mask.)
... Sclerotized structures B absent, an irregular fold present, structure A usually narrow and elongate; fourth lobe-like process usually prominent, ... *citrina* (Coq.)

The type specimen and paratypes of this species are deposited in the U. S. National Museum, at Washington, D. C.; the remainder of the paratypes are in the Stanford University collection and the Citrus Experiment Station collection at Riverside, California.

[3] The reader is referred to item four in the bibliography where these structures are clearly illustrated and described.



AONIDIELLA EREMOCITRI n. sp.

A, antenna of first stage; B, spiracle of adult female; C, scale of female; D, antenna of adult female; E, enlargement of fenestration on body; F, general features of adult female; G, pygidium of adult female; H, dorsal aspect of detail of pygidial margin of adult female; I, ventral aspect of same.

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A NEW NOTONECTA FROM MEXICO

(Hemiptera-Notonectidæ)*

BY H. B. HUNGERFORD

Lawrence, Kansas

Among the insects collected by Mr. Henry Thomas in Mexico during the season of 1936 there is a new species of the genus Notonecta which I describe below and name in honor of the collector.

Notonecta thomasi Hungerford, n. sp.

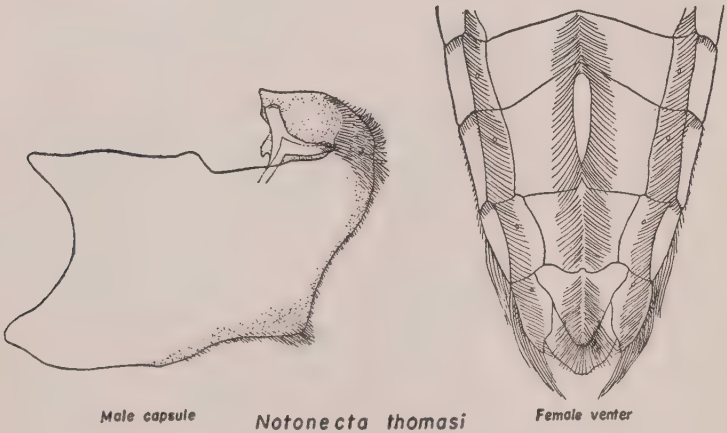
Size: Length 12 mm. to 13 mm.; width of pronotum, 3.9 mm. to 4.2 mm.

Color: Grayish and black, the lighter portion of the hemelytra ranging from pale smoke-gray in most of the males to light pinkish cinnamon in four of the five female in the series before me. No doubt, the gray color of the hemelytra may be orange in some specimens of the species, as is the case with *Notonecta hoffmanni* Hungerford and various other species of the subgenus Erythronecta, to which this new species belongs. The hemelytra of the males are more or less infuscated along the hemelytral suture, the clavo-corial union and the lateral half of the corium; the brownish black marginal area of the corium is broadened behind and joins the black membrane which is pale at the apex. The hemelytra of the females are infuscated only along the costal margin. Head, pronotum, and legs grayish. Scutellum black.

*Contribution from the Department of Entomology, University of Kansas.

Membrane of hemelytra from dusky to black. All trochanters and femora streaked beneather with black.

Structural characteristics: More slender than any other of the known species of the subgenus Erythronecta. Head not conspicuously enlarged; vertex plainly longer than its anterior width; anterior margin of vertex less convex than the frontal margin of the eye; anterior breadth of vertex:synthlisis :: 3.4:1. Length of head: length of pronotum :: 1:1.35. Lateral margin of pronotum nearly straight, slightly divergent, explanate on anterior half, anterior lateral angles right-angulate as seen from above; lateral ledge with ends depressed, anterior end abruptly so. Anterior lobe of membrane of hemelytra larger and longer than posterior lobe. Anterior trochanter of male without hook. Mesotrochanters rounded. Carina of fourth abdominal sternite bare; penultimate abdominal sternite of female shaped more like that of *N. undulata* Say than like that of other species of the subgenus Erythronecta, but shallowly notched at tip. The last abdominal sternite of female and the male genital capsule are as shown in text figures below.



Location of types: Holotype, allotype and paratypes in the Francis Huntington Snow Entomological Museum of the University of Kansas. Described from seven males and five females labeled as follows: "Cuernavaca, Morelos, Mexico. Oct. 17, 1934. H. D. Thomas."

Comparative notes: More slender than any other species of the subgenus Erythronecta known at present. The species is like *N. Hoffmanni* Hungerford in having the lateral margins of

pronotum straight but they are less divergent. In the new species the anterior end of the lateral margin of the pronotum is turned down. This is not true of *N. hoffmanni*. The male claspers are very different and the penultimate ventral abdominal segment of the female is relatively broad and therefore very different from *N. hoffmanni*.

STUDIES AMONG THE COCCINELLIDÆ, No. 8 (COLEOPTERA)

BY F. W. NUNENMACHER

Piedmont, California

I have received two shipments of Coccinellidæ from Dr. A. Ogloblin of Argentina, South America. Among this material I find three new species, as follows:

Stethorus ogloblini Nunenmacher, n. sp.

Form oval, subdepressed. Color black, shining; mouth parts, tibiæ and tarsi testaceous, femora black.

Head with a few scattered punctures. Pronotum densely and rather coarsely punctured; punctures of the elytra coarser; pubescence short and cinereous. Metacoxal plates short, not extending to the middle of the segment. Length 1 mm.; width 0.75 mm.

Type, female, in my collection. Type locality: Loreto Misione, Argentina, South America. Collected in 1936. A paratype in the collection of Dr. A. Ogloblin.

Scymnus convexus Nunenmacher, n. sp.

Form oval, convex. Pronotal and elytral outline continuous.

Male: Color of head and pronotum light yellow, elytra fuscopiceous, legs and ventral segments testaceous, mesosternum and metasternum dark. Female: Head, pronotum and elytra fuscotestaceous; pronotal front and sides a little lighter; the elytra with a narrow dark margin; legs and ventral surface testaceous throughout.

Head, pronotum and elytra densely, minutely punctured and invested with a short, fine whitish pubescence. Ventral surface minutely punctate. Length 1 mm.; width 0.75 mm. or slightly more.

Holotype, male and allotype, female, in my collection. Type locality: Est. Exp. Loreto, Argentina, taken March 6, 1936, by Dr. A. Ogloblin, who has a paratype.

Convexus belongs to Group C, of Dr. Horn's table of species which have the metacoxal line curving but not making a full arc.

DELPHASTUS ARGENTINICUS Nunenmacher, n. sp.

Form broadly oblong-oval, moderately convex. Color deep black, highly polished and subglabrous.

Male: Head and anterior angles of the pronotum, legs and last four ventral segments rufescent; epipleuræ black. Female: Head and pronotum black, with only the mouth-parts rufescent.

Head and pronotum with minute sparse punctures, those of the elytra still more widely spaced. Length 1.3 mm.; width 1 mm.

Type locality: Bella Vista Prov. Corriet, Argentina, June 14, 1936. A. M. B. collector. Argentina.

Type, male, in my collection. Two paratypes in the collection of Dr. A. Ogloblin.

Argentinicus comes close to *sonoricus* Casey, but the black epipleuræ will separate it from the latter species, in which the epipleuræ are rufescent.

Scymnus quercus described by me in the Pan-Pacific Entomologist, vol. X, p. 18, will have to be given a new name, as I overlooked *Scymnus quercus* Muls. (Securipalpes, p. 982, 1850. I now give my species the name **maderi** nom. nov.

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CONCERNING THE PLEBEJUS ICARIOIDES RASSENKREIS
(Lepidoptera: Lycaenidæ)

BY WILLIAM HOVANITZ

University of California, Berkeley

The western part of North America, due to its diverse topography and climatic conditions,[1] is a region of many barriers to animal migration. Because of this a species (Rassenkreis) may develop several races geographically close together. This necessitates, in working out a scheme of geographical variation, a knowledge of the exact type locality of each "species" or race previously described. As is well known, this was an insignificant part of early-day writings due to a different concept of the species, in consequence of which there is still some doubt as to the correct interpretation of names proposed. The names must be applied to those races which best fulfill the author's description and type locality, and, if the type specimen can be positively identified, must agree with the type. However, when a description can apply to specimens of more than one race, when the type (if such ever existed) is lost, and when no exact locality is given, the only course possible is to place that name as a synonym of the original name applied to the Rassenkreis without regard to race.

The Rassenkreis, *Plebejus icarioides* (Bdv.), occupies the entire continent of North America west of the Central Great Plains region. In this area it has developed numerous divergent races, some more differentiated than others. Some variation, no doubt, is directly caused by climatic conditions under which the butterflies live. Most races follow rather closely the life-zone areas on the western exposures of the mountain ranges whilst in arid regions, races seem to have little to do with altitude. However, before real distributional work can be done much more information must be gained and collections with better data made.

Plebejus icarioides icarioides (Bdv.)

Lycæna icarioides Bdv. 1852. Ann. Soc. Ent. Fr., 21:297.

Boisduval (1869) states that Lorquin collected his Californian material somewhere between San Francisco and the moun-

[1] Authors consistently use this as a basis for genetic differentiation, as if differing climatic conditions by its direct effect genetically changes the heredity of an organism. The inheritance of acquired characters is, of course, not accepted.

tains to the east and in northern California. He mentions the placer mining areas in the "Juba" mountains which are the foothills of the central Sierra Nevada. In the description of this particular species he states that the specimens are from the mountains. At the time Lorquin was in California the only areas open in the mountains were these "Juba" mining areas and the Truckee and Placerville roads to Lake Tahoe and Nevada. Specimens collected today between 2000 and 4000 feet elevation (between Transition and Upper Sonoran life-zones) along either of these roads or in the "Juba" mountains agree with the report given of the type by McDunnough (1914) as well as a report he has communicated to me. Specimens from higher elevations show the tendency toward the orange margins on the upper side of the wings mentioned by McDunnough as being present on several specimens (females) examined. Other specimens mentioned by him as having the black spots on the under side nearly obsolete are more typical of those which fly at higher elevations and approach the Nevada race *ardea* Edws. Although unfortunately I have been unable to refer to the figure of the type (more exactly a cotype) shown by Oberthür nor to the types said to be in the U. S. National Museum, because of the convincing information of the type locality and the agreement of the description with specimens taken at that locality, I place the type locality of the race *icarioides* (Bdv.) as : 2000-4000 feet El Dorado and Nevada counties, California. It is to be noted that Lorquin might very well have collected specimens of the race *ardea* (Edws.) (those in which the spots are nearly obsolete) ; all of which Boisduval classed as his types.

PLEBEJUS ICARIOIDES PARDALIS (Behr)

Lycæna pardalis Behr 1867. Proc. Calif. Acad. Nat. Sci., 3:279

The description of this race being in Latin is rather short but to the point. The male is blue and the female entirely brown. It is figured in Holland (1931) and Comstock (1927) as *maricopa* Reakirt. The types were destroyed in the San Francisco fire of 1906 and no figures of them exist. The type locality, however, makes its identity undoubted. Behr (1867) writes, "The only habitat of this species yet known to me is in the Contra Costa Coast Range, in the vicinity of San Antonio, where it frequents steep, grassy hillsides". The Contra Costa Coast Range

is a name used in the early days of California for the Berkeley and Oakland hills facing San Francisco on the west (Contra Costa means "on the other side", that is, on the other side of the bay from San Francisco). San Antonio is the name of a very early settlement situated just to the south of San Antonio Creek (now Lawe Merritt) in the center of the present city of Oakland. The hills to the east are those referred to, now covered by the city. Typical specimens may still be obtained a few miles to the south in the Redwood Peak region or to the north in the Berkeley hills. Barnes and McDunnough's (1916) figure of a specimen from Sonoma County seems typical but is north of the type locality. For the interpretation of Behr's geographical locations I am indebted to Prof. Edwin C. Van Dyke of the University of California.

Plebejus maricopa (Reakirt)

Lycæna maricopa Reakirt 1866. Proc. Acad. Nat. Sci. Phil. 1866:245.

Reakirt's description is very important. The first paragraph follows: "Male. Upper side brown, glossed with violet blue, a narrow terminal line along the outer margins; a black discal bar on the primaries, sometimes wanting, and some obsolete rounded spots on the hind margin of the secondaries. Fringe ash colored." Also part of the second paragraph: ". . . three transverse maculate bands; the first composed of eight large rounded black spots, . . .". From this I deduce the following:

1. The description is of a female as none of the *Plebejinæ* are known with males brown on the upper side.

2. " . . . a black discal bar on the primaries, sometimes wanting" could only mean that he had more than one specimen to draw his description from and possibly more than one race. Also in the last sentence of the second paragraph of his description he says, ". . . and the seventh spot of the first and second rows are sometimes confluent." Obviously he was describing a variable series of specimens.

3. The "type" specimen in the Strecker collection does not have any blue or violet-blue gloss or suffusion on its upper surface (Barnes and McDunnough 1916) and therefore, although it may have been in Reakirt's series of specimens, because of its

disagreement with the description and for other reasons as stated by Barnes and McDunnough it cannot be designated the type.

4. The type locality "California" is of little value except that a study of Reakirt's travels in the state might enlighten the subject. He is supposed to have collected from the vicinity of Los Angeles through the Sierra Nevada foothills (at that time busy with mining activities) to Sacramento (Essig 1931). However, there is some doubt as to whether he collected in the state at all. In the Tehachapi (Comstock 1927) he might have obtained the specimen now in the Strecker collection. Here also he might have gotten the name *maricopa* from the town by that name in Kern County.

5. Therefore, as no valid type exists, as no type locality is known, and as the description is too poor to adequately place the name other than as some form of *icarioides* with large spots (of which several exist), the name *maricopa* Reakirt must be considered a synonym of *icarioides* Bdv. and *pardalis* Behr must be removed from the synonymy of *maricopa*.[2]

Plebejus icarioides missionensis Hovanitz, new race

Size identical with *P. pheres* (Bdv.).[3] Upper surface of wings: Male, identical with *pheres*; blue with black border and white fringes; anal angle and body clothed with white hair. Female, identical with *pheres* except for the slightly greater restriction of the blue towards the base of the wings; marginal row of black or slightly blue spots at lower end of outer margin of secondaries. Under side: Male and female almost identical; ground color of a darker shade than in *pheres*; two rows of black spots on both primaries and secondaries, those on primaries much the same as in *pheres* but outer row darker; secondaries differing from *pheres* in having inner row of spots round, black and encircled with white: outer row smaller and not encircled with white.

Missionensis differs from *pheres* (Bdv.) in having black instead of white spots on the under side secondaries, from *pardalis*

[2] In weighing evidence for the correct interpretation of names, I place of greatest importance locality and secondly description. Evidence of a type specimen I give due consideration. The reasons for this I believe are obvious: Type specimens may be mislabelled or mixed, etc., descriptions are not always accurate and may have been drawn from a few atypical specimens of the race.

[3] This combination, I believe, is new in print. *Plebejus icarioides pheres* (Bdv.).

(Behr) in having smaller black spots and with a blue suffusion in the female, from *icarioides* (Bdv.) in having greater hairiness of the body and wings, in the different shade of blue and in its smaller average size, and from *moroensis* Sternitzky in having larger black spots on the under side of secondaries. No genetalic study has yet been made of these races.

Holotype ♂ (No. 4526, C.A.S., Ent.) Twin Peaks, San Francisco, Calif. Elevation 700 ft. April 10, 1934. Collected by the author. Placed in the collection of the Calif. Acad. Sci. *Allotype* ♀ (No. 4527, C.A.S. Ent.). Same locality, date and disposition made. *Paratypes.* None designated but the author will furnish determined topotypicals.

We have found that the type locality of *P. icarioides* (Bdv.) is the central Sierra Nevada foothills of approximately 3000-4000 feet elevation. This, therefore, restricts the above name to that certain montane race of the Rassenkreis. The same author named another butterfly *pheres*, which differed by having white spots on the secondaries instead of black, and which was taken in San Francisco. Also in San Francisco is found a race differing from both of these and which apparently does not have a name. This I have described above as *Plebejus icarioides missionensis* Hovanitz.

P. i. pheres (Bdv.) is found on the sand-dunes of western San Francisco on, or in relation with, the larval food-plant, *Lupinus chamissonis* Esch. No other locality is known. *P. i. missionensis* Hovanitz flies in a different but contiguous area to the east, being abundant on the Twin Peaks and Mission District hills of the city, in areas where *Lupinus variicolor* Steud. is found. It thus occupies a region between *pheres* and *pardalis* but cannot be considered a transition or intergrade. All these races agree with Jordan's Law in that they occur in different but adjacent areas; and, it is also of interest to note that the larval food plant, and climatic conditions of each are different. The writer realizes that because of lack of definite knowledge of intergradation, some authors might wish these to remain as separate species; however, whether one wishes to call them species or subspecies, they are at least different races and for matter of convenience the trinomial had better be used. Because of the differing current usage of the terms species and subspecies, the author be-

lieves the following two old terms deserve greater use in designating these concepts: 1. *Race* to be used for the only taxonomic category recognizable in nature; this is identical with what has been called the subspecies. 2. *Rassenkreis* to designate the connected series of races which by some is called the species. Both of these are old terms whose meanings have not become warped. The former is known to all. The latter is finding much greater use in America of late although it has been used in Europe (Germany) for some time. The species-subspecies terminology implies that the species is a definite category from which various geographical variants (subspecies) have arisen and which by isolation in space and time will become species. Any subspecies must intergrade with some other subspecies or it is elevated to specific rank. The Rassenkreis (racial circle) terminology does not imply any origin of a species for this still seems to be a debatable question. It is merely a connected series of related races, many of which may be isolated so that intergradation can not take place and does not imply that races are incipient species (Rassenkreis). However, some writers go so far as to say that the Rassenkreis is definite in nature and that racial variation occurs only within this unit. Two other terms have sometimes been used, *complex* and *exerge*; the former referring to a closely related group of races and, in many cases, obviously meaning a Rassenkreis, and the latter referring to a geographical branch of a racial circle produced by straight-line migration. Use of the former should be avoided as it has no definite meaning but the latter (exerge) is a good term to use in describing geographical distribution.

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A NEW SPECIES OF VALGUS AND A NEW GENERIC RECORD FOR MEXICO

(Coleoptera-Scarbaeidæ)

BY MONT A. CAZIER

University of California

Valgus mexicanus Cazier, new species

Small, robust, flattened, black, sparsely squamose. Head narrow, shallowly excavated between the eyes, sparsely clothed with small erect squamæ, each squama arising from a small elevated pore which is surrounded by a shallow circular or lunate groove; clypeus feebly notched in center of anterior margin; antennæ nine-segmented, club longer than funicle. Pronotum longer than broad, gradually deflexed from apical third, widest at base, gradually narrowing to front, lateral margins bluntly serrate, posterior margin evenly rounded, middle carinæ prominent, not acute, impression at basal third shallow; apical two-thirds sparsely covered with circular or lunate grooves, basal grooves forming striations that rotate outward from mid base of disc; sparsely clothed with narrow, black squamæ on carinæ, raised portions of disc and lateral edges; outer angles and posterior and anterior margins with small groups of large, flattened, white squamæ. Elytra short, flattened, basal margin concave, humeral umbone prominent, connected to the prominent apical umbone by a ridge, middle of disc with several smooth, narrow bands, striations irregular, formed by series of connected lunate grooves, lateral grooves both lunate and circular, separated; large, flat, white squamæ confined to center of disc forming an irregular line down sutural third from base to apical umbone; narrow, erect, black squamæ sparsely scattered over entire surface. First visible abdominal segment with a prominent tubercle on posterior edge at lateral extremity; entire surface moderately clothed with narrow, erect, black squamæ and large, white, flattened squamæ, each pore surrounded by a circular groove; pygidium evenly rounded at sides, with small flattened, slightly concave section at extreme apical tip, clothed with scales and sculptured as in first visible segment except that the margins are lined with narrow, white squamæ which are rather dense at apical extremity. Beneath, body and legs, moderately clothed with white, broad and slender squamæ, separated from each other by their own lengths; anterior half of gena densely clothed with large, flat, white squamæ, posterior portion bare or with a few scattered scales, sculptured as on dorsal surface; legs short, side margin of anterior tibia with two large teeth separated by a smaller one; anterior tarsi with first segment one-half as long as second, two, three and four equal, five slightly longer than four; middle tarsi with first four segments

equal, five slightly longer; hind tarsi with first four segments equal in length but with first more robust, second, third and fourth becoming gradually smaller (not shorter), fifth slightly longer than fourth; claws simple. Length 4-5 mm.

Type locality, Orizaba Mexico, June, 1929, collected by G. Trussel. Holotype male and three paratypes in the author's collection, one paratype in the collection of Hugh B. Leach, one in the collection of L. W. Saylor and one in the collection of the California Academy of Sciences.

This is the first record of this genus from Mexico or from south of the United States and, although the species is distinct in most of its characters including tarsi, thorax and pygidium, from our four species, I do not think that it will be of any value to erect a new genus or subgenus on the basis of these differences as has been done in Europe. I have not recognized the subgenera *Homovalgus* and *Acanthurus* because they also are of little value.

In the seven specimens before me there is little variation except in the number of squamæ present. The type specimen has the maximum number in the series whereas some of the other specimens are nearly devoid of all squamæ on the dorsal surface. In one specimen there are two tufts of scales in the center of the first visible abdominal segment. This species is most closely related to *V. canaliculatus* and *V. seticollis* of the United States, being nearest to *canaliculatus*. It differs from *canaliculatus* by having the body very sparsely covered with squamæ, the posterior margin of prothorax evenly rounded, the presence of the prominent tubercles on the first visible abdominal segment, the flattened tip of the pygidium, the tarsal character as given in the key, and the black color. The only other black species described from North America is *V. californicus* which is much larger and differs by having the prothorax nearly square, by the absence of the striæ on prothorax, and by the characters given in key.

Key to the North American species of Valgus

1. First segment of posterior tarsi slightly longer than second, equal in length to fifth,.....*mexicanus*
... First segment of posterior tarsi as long as two and three combined and from one and one-half to two times longer than fifth, ...2

2. Sparsely clothed with narrow squamæ, prothorax as broad as long, ...3
... Moderately to densely clothed with large flat squamæ, prothorax longer than broad, ...4
3. Head deeply excavated between the eyes, black, ...*californicus*
... Head flat between the eyes, brown, ...*minutus*
4. Ventral surface of abdominal segments covered with a dense pad of squamæ in center in male; disc of elytra elevated; female with corneous process on pygidium, ...*canaliculatus*
... Ventral surface of abdominal segments sparsely clothed with squamæ in male; center of disc of elytra with elevated area; female without corneous process on pygidium; lateral margins of abdominal segments, first visible abdominal segment and pygidium densely clothed with flat squamæ, ...*seticollis*

I want to express my thanks to Dr. E. C. Van Dyke for his assistance and to G. E. Bohart for testing the key.

A New Entomological Glossary

A Glossary of Entomology. By J. R. de la Torre Bueno F.R.E.S. Lancaster, Penn., 1937. 8vo, 336 pages, IX plates. Price $5.

While cited as a completely revised and rewritten edition of "Smith's Explanation of Terms Used in Entomology" this is in fact a new work. It shows a great amount of patient research that few would have the time or patience to bestow. A rough estimate gives about 8,000 words that have been defined in a brief but concise manner. The author's treatment of the question of "types" should do much to standardize that somewhat involved subject. Much of the type terminology has developed since my earlier work. Then all specimens used in founding a species were types; later one was selected as the type and all others were co-types. Such now are called paratypes and the selected type is the holotype. Mr. Bueno's explanation of the terms subspecies, race and form should do much to stabilize the nomenclature of some of our beginners of the younger generation who have not given this matter proper consideration.

One could go on indefinitely pointing out the importance of a work such as this. Suffice it to say it is indespensible to our younger students and scarcely less so to those more experienced. The two appendices giving Latin definitions and arbitrary symbols will be found very useful, as will also the nine plates for which there are full explanations.—E. P. Van Duzee.

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